

THE EXPANDED PROGRAMME ON IMMUNIZATION

A DECADE OF PROGRESS IN INDIA.



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THE EXPANDED PROGRAMME ON IMMUNIZATION:
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by

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ABSTRACT

The Expanded Programme on Immunization (EPI) was initiated in India in 1978 with the objective to reduce morbidity and mortality due to diphtheria, pertussis, tetanus, poliomyelitis and childhood tuberculosis by providing immunization services to all eligible children and pregnant women by 1990. Measles vaccine was included when the EPI was accelerated by launching the Universal Immunization Programme (UIP) in 1985-86. Approximately half of all infants now receive complete primary immunization with DPT, OPV and BCG vaccine. Forty six percent of pregnant women currently receive a second or booster dose of tetanus toxoid (TT). Surveillance reports from selected areas have documented impact through reduction of disease incidence. Although vaccination coverage levels are increasing, continued acceleration is needed to achieve the universal levels targeted for 1990.

KEYWORDS

Immunization programme; EPI; Immunization coverage;
Surveillance; Disease impact; Evaluation.

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INTRODUCTION

The Expanded Programme on Immunization (EPI) was initiated in India in 1978 with the objective to reduce morbidity and mortality due to diphtheria, pertussis, tetanus, poliomyelitis and childhood tuberculosis by providing immunization services to all eligible children and pregnant women by 1990. Measles vaccine was included in the programme in 1985-86. The EPI also aims to achieve self-sufficiency in the production of vaccines required for the programme.

The Universal Immunization Programme (UIP) was launched in 1985-86 to accelerate immunization coverage in eligible populations and to improve the quality of services. The UIP is a carefully planned strategy for systematic district-wise expansion of the immunization programme to cover all the districts by 1989-90 (1,2). The target in UIP districts is to achieve universal coverage within one year and maintain these high levels in subsequent years.

India is a vast country and the goal of universal immunization is a formidable challenge. The UIP targets to achieve at least 85 percent coverage in infants and 100 percent coverage in pregnant women in all districts of the country by 1990 means that, over a five year period, more than 90 million pregnant women and 83 million infants will need to be immunized.

This paper documents the progress of the immunization programme in India during the decade from 1978 to 1987 and discusses future directions and remaining challenges in implementation of the UIP.

HISTORICAL BACKGROUND

BCG vaccine was introduced in the early 1960's under the National Tuberculosis Control Programme. Mobile teams of BCG technicians moved from village to village vaccinating children and young adults up to 19 years of age. BCG vaccine was integrated with the EPI in 1981-82 and emphasis shifted to immunizing children under two years of age.

DPT, DT and tetanus toxoid (TT) vaccines were provided under maternal and child health services (MCH) since the early 1970's. DPT vaccine was provided to children up to five years of age. These vaccines were also integrated with the EPI in 1981-82 with a similar priority to children under two years of age and an extension of the use of TT vaccine to school children in the last classes of primary and secondary schools.

OPV was introduced into the EPI in urban areas in 1979-80 and was quickly extended to rural areas when results of

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poliomyelitis lameness surveys conducted in 1981 and 1982 confirmed that poliomyelitis was just as much a public health problem in rural as in urban areas.

Measles vaccine was introduced with the launching of the UIP in 1985-86. The vaccine is currently available in UIP districts, medical college hospitals and major urban areas.

The currently recommended immunization schedule for infants is three doses of DPT and OPV (with an interval between doses of one month) and one dose of BCG vaccine starting as early as six weeks of age. One additional dose of both DPT and OPV is recommended 12 to 18 months after the third dose. One dose of measles vaccine should be given as early as nine months of age. Children over 12 months of age are not denied primary immunization services on demand. Two doses of TT vaccine (with an interval between doses of one month) are recommended for women during their first pregnancy and one booster dose is recommended in each subsequent pregnancy.

PROGRAMME PROGRESS

Immunization Coverage

Immunization coverage in infants has increased substantially over the last decade (Figure 1). The target group of the programme shifted from children under five years of age in the early years of the programme (1977-78 to 1979-80) to children under two years of age. The target group was subsequently changed to children less than one year of age after the launching of the UIP in 1985-86, although older children are not denied immunization services on demand. The strategy of progressively narrowing the target group to the more appropriate age group of children under one year of age means the increasing trend of coverage for infants in recent years is actually steeper than shown and the decline from 1977-78 to 1979-80 is a reporting artifact.

Immunization coverage in pregnant women for TT has shown a steady increase over the last decade (Figure 2). It would be expected that the number of women sufficiently immune to protect their newborns from neonatal tetanus (NNT) would actually be much higher because pregnancies within five years after a third dose or ten years after a fourth dose of TT are considered to be adequately protected (3).

These immunization coverage levels estimated from doses administered may differ from the true coverage achieved due to a variety of factors, including: immunizations provided but not reported by the private sector resulting in artificially low coverage or immunizations provided to children over one year of age reported as being provided to children under one year of age resulting in artificially high coverage. The contribution of the private and voluntary sector in large urban

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areas may be substantial and it would be anticipated that the underreporting of doses administered by the private and voluntary sector helps to balance out, on a country level, overreporting due to some areas including doses administered to children older than one year of age. Immunization coverage surveys, discussed later, provide a means for more accurately assessing immunization coverage in a defined geographic area.

Immunization coverage levels reached in India in 1986-87 compare favourably with coverage levels in South East Asia and other Regions, especially for TT coverage of pregnant women (Table 1). Coverage with measles vaccine, only recently introduced into the programme, is expected to markedly increase in the next few years.

Disease Surveillance

Information on vaccine preventable diseases is based primarily on the routine reporting system (passive reporting). The data are largely hospital based and submitted by the State Health Authorities to the Central Bureau of Health Intelligence (CBHI). Even though the system has limitations due to variability in quality and regularity of reporting, the data confirm the enormous disease burden due to these vaccine preventable diseases. Surveillance over the last decade suggests that there has been a decline in the incidence of diphtheria (Figure 3). The likelihood that this decline is real is strengthened when this trend for diphtheria is compared to reported incidence of measles which has not shown a similar reduction (Figure 4). Measles is a general indicator of the surveillance system since measles immunization coverage has not yet sufficiently increased to a level where an impact could be expected. Although impact for the other diseases is not yet as clearly documented in the national level data, there is a downward trend for tetanus, pertussis and poliomyelitis (Figures 5-8). It should be noted that for some diseases the method of reporting is not conducive to detecting the greatest impact. Data on tetanus, for example, are collected for all cases of tetanus, rather than separately for neonatal tetanus. Similarly, the data on tuberculosis are for all cases of tuberculosis rather than only for cases of childhood tuberculosis.

Large scale sample surveys for neonatal tetanus and poliomyelitis were conducted in 1981 and 1982 to collect statewide baseline epidemiological data on poliomyelitis and neonatal tetanus. Such information, combined with repeat surveys or other surveillance data, will be useful in documenting impact as immunization coverage in selected areas reach high levels.

Infant Mortality Rate (IMR) is an overall indicator of coverage of quality maternal and child health (MCH) services, including immunization. The fact that the IMR in India has now

dropped from an average of 124 during the period 1976-1980 to below 100 suggests that immunization, among other factors, is beginning to show an impact on infant mortality.

Several steps have been initiated to strengthen the surveillance system during the last two years. Standard case definitions of vaccine preventable diseases, for example, have been circulated to all treatment centres to improve uniformity in diagnosis and recording of cases at all levels. Designation of infectious diseases (ID) hospitals as well as district level hospitals and medical college hospitals covered under the UIP as sentinel centres is another example of strengthening the surveillance system. Records from these sentinel centres are being analysed separately and demonstrate disease impact in selected areas.

Training

Training and upgrading skills of health workers is a high priority and considerable progress has been made in training medical officers and health workers regarding the immunization programme. Several training materials suited to the specific needs of the immunization programme in India have been prepared. A handbook for medical officers and a task oriented manual for health workers were published in 1984 and 1985, respectively. The manual was subsequently revised in 1986 and 1987 based on feedback received from the field and is now available in the major regional languages. Training modules for medical officers were revised in 1987 based on adaptation of the WHO modules on planning and management of the EPI for mid level managers. These training modules have been developed according to the needs of the UIP for a five day training course, including one day of field work to conduct a vaccination coverage evaluation survey. This condensed, more specific and task oriented training course has helped to emphasize the importance of programme acceleration.

Medical officers from district level and above who are responsible for the immunization programme attend a five day training course at the national level. Medical Officers in charge of Primary Health Centres (PHCs) attend a four day training course held at the district level. In addition, a two day task oriented training course for health workers is organized at the PHCs.

Involvement of Professional Societies and Voluntary Organisations

India has a large number of committed professional societies and voluntary agencies which have joined in partnership with Government agencies to improve immunization services. The Indian Academy of Paediatrics, for example, is actively supporting the programme and assisting in improving the surveillance of vaccine preventable diseases. The Indian

Medical Association, through its numerous branches in the states, is similarly encouraging its members to become actively involved in immunization programme activities. These two professional societies also provide information to their membership on the latest developments in the immunization programme and offer special workshops and orientation courses. Service organizations, such as Rotary, have already begun to assist Government in efforts to mobilize community support for the programme, especially in urban areas.

All medical colleges in the country are now directly involved from the planning to evaluation stages in the immunization programmes within their catchment or field practice areas. The immunization programme benefits from the experience and professional staff of the medical faculty who also participate in immunization training programmes and national evaluation activities. The participation of medical students and interns inculcates a sense of community service and a better understanding and involvement in the immunization programme.

Budget and Supplies

The Government of India has allocated Rs 2.4 billion for the immunization programme over the five year period from 1985 to 1989. This additional input has enabled formulation of long term plans for the programme and makes it operationally feasible to attain high levels of coverage with quality services. The cold chain is being strengthened by providing storage and transportation equipment. Syringes and needles are being provided in sufficient numbers to ensure the use of a single sterile syringe and needle for each child. Mobility of the supervisory staff is being increased to improve logistics of vaccines and other supplies and to strengthen field monitoring of services.

Vaccine Production

The vaccine requirements in India exceed that of any other country. By the end of 1990, over 100 million doses each of DPT, OPV and TT vaccines and nearly 50 million doses of BCG and measles vaccines will be required annually.

India is currently self sufficient in the production of all vaccines except measles and OPV. The production of measles vaccine has already begun and measures have been initiated to develop the capacity to produce OPV as well. The aim is to produce all vaccines required for the immunization programme by 1990.

Programme Evaluation and Vaccination Coverage Surveys

As immunization coverage levels improve, it becomes increasingly important to strengthen field monitoring of services to maintain programme quality and to conduct periodic surveys and evaluations to confirm achievements and to suggest ways to further improve programme operations.

Vaccination coverage evaluation surveys are being increasingly used as evaluation tools, especially since the start of the UIP. To date, over 257 such surveys have been conducted, including 93 surveys in 1987 alone. The results of these surveys, detailed elsewhere (4), confirm high levels of immunization coverage are being achieved and sustained in several areas of the country. More than a fifth (20/93) of the surveyed areas recorded coverage levels of 75 percent or more with 3 doses of DPT and OPV and more than half the areas (51/93) documented coverage levels between 50 to 74 percent (Fig.9). Coverage levels of above 75 percent with 2 doses or a booster dose of TT during pregnancy were reported in 41 percent (32/78) of the surveyed areas. The surveys document the impressive progress in immunization coverage in selected areas where results of serial surveys are available. These surveys have also elicited reasons for failure to fully immunize children which have helped to develop specific corrective measures and direct programme activities to areas of low coverage.

A methodology for comprehensive review of programme operations at the district level has been developed for mid-term evaluation. The objective of these reviews is to document the achievements as well as to identify weaknesses and problems that may require corrective action or additional support. Such reviews identify common problems and propose recommendations which help to streamline operations and field implementation in other districts. These programme reviews include studies to determine actual immunization coverage levels achieved, observations of operations and implementation strategies at various levels in the districts and data analysis from lameness surveys and sentinel hospitals to document impact on disease trends.

Detailed programme reviews of selected districts were begun in 1987. To date, 4 districts have been covered by national teams drawn from outside the concerned state. The team members included senior State EPI officers, professors from medical colleges, representatives from the national institutions, the Indian Council of Medical Research, the Ministry of Health and Family Welfare, WHO and UNICEF (5,6,7,8).

CONCLUSION

The goal of universal immunization, although difficult and ambitious, is attainable. The successful implementation of the programme in a country as large and diverse as India requires careful planning, effective management and optimal use of available resources. Although the techniques of immunization are relatively simple, the administration of the programme is complex, requiring a very close coordination of work between personnel engaged in different tasks at various levels. The sense of commitment and urgency which has been generated with the launching of the UIP and the creation of the special Technology Mission on Immunization will help to achieve universal immunization. The strategy of phased expansion of the UIP is capable of achieving and sustaining the goal of universal immunization in India, a major stepping stone towards our ultimate goal of Health for All by the Year 2000.

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REFERENCES

1. Towards Universal Immunization - 1990. Ministry of Health and Family Welfare, Government of India, New Delhi 1985.
2. Sokhey J: Universal Immunization Programme 1985-86 - Data at a Glance. Ministry of Health and Family Welfare, Government of India, New Delhi 1985.
3. Galazka A: Immunization of pregnant women against tetanus. WHO Geneva. EPI/GEN/83/5.
4. Sokhey J, Kim-Farley R: Vaccination coverage evaluation surveys: India, 1987 (In press).
5. Sokhey J (Ed): Universal Immunization Programme - National Review Bharuch, Gujarat 23 June to 3 July 1987. Ministry of Health and Family Welfare, Government of India 1987.
6. Sokhey J (Ed): Universal Immunization Programme - National Review Sagar, Madhya Pradesh 13 to 24 July 1987. Ministry of Health and Family Welfare, Government of India 1987.
7. Sokhey J (Ed): Universal Immunization Programme - National Review, Kota, Rajasthan 27 July to 7 August 1987. Ministry of Health and Family Welfare, Government of India 1987.
8. Sokhey J (Ed): Universal Immunization Programme - National Review, Thane, Maharashtra 10 to 21 August 1987. Ministry of Health and Family Welfare, Government of India 1987.

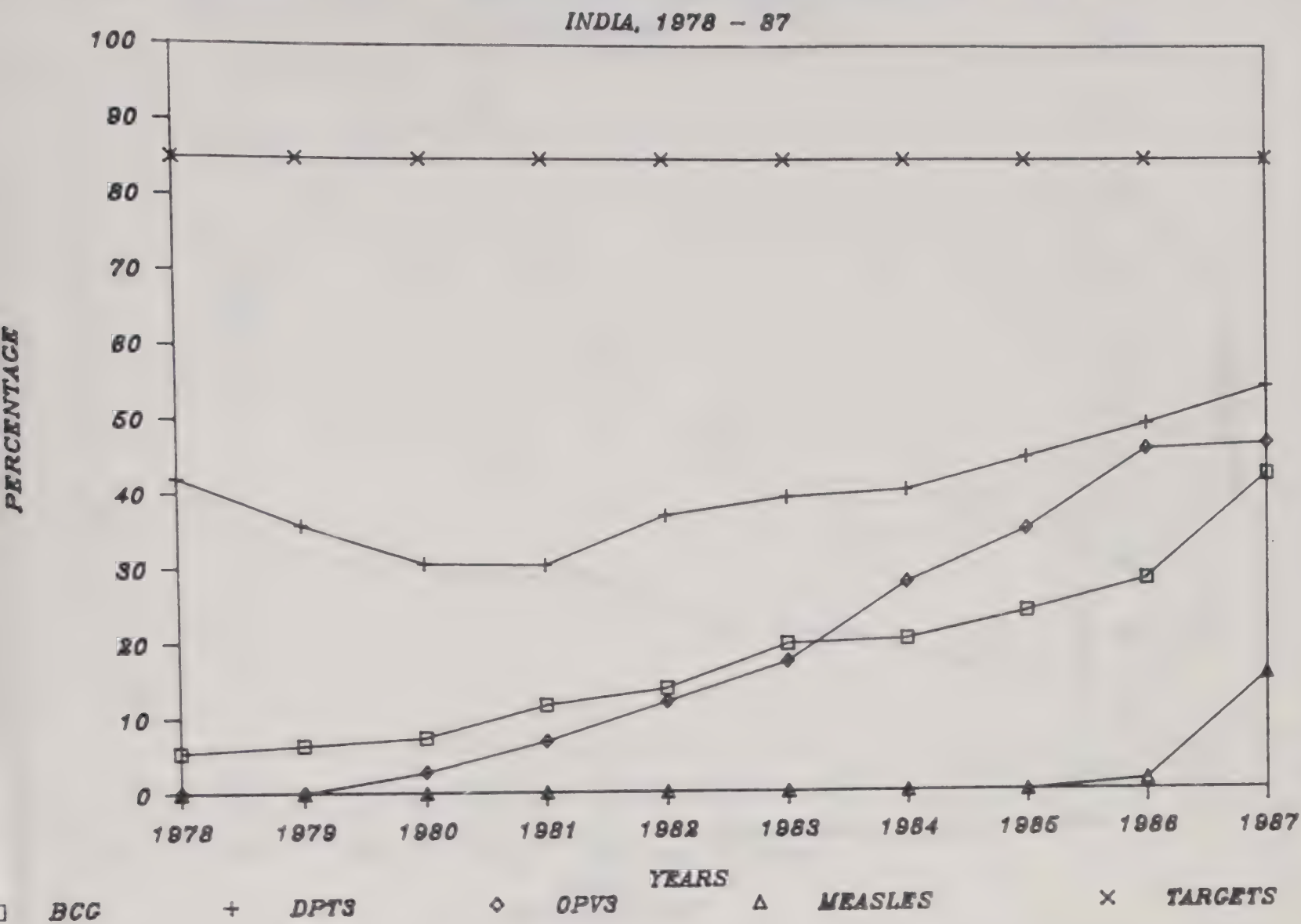
Table 1Estimated Vaccination Coverage in the WHO Regions
and in India 1986-87

<u>Region</u>	<u>Percent Coverage</u>				
	<u>TT2</u>	<u>DPT3</u>	<u>OPV3</u>	<u>BCG</u>	<u>MSL</u>
African	18	32	30	47	36
American*	0	49	76	61	56
Eastern					
Mediterranean	19	59	59	63	50
European	0	80	89	73	79
South East Asian	34	48	41	35	12
Western Pacific	4	61	66	68	60
Global	16	52	54	52	43
India	46	57	49	49	17

*excludes USA & Canada.

Source: Global EPI Information System 12 January 1988 (based on information available December 1987)

FIGURE 1: IMMUNIZATION COVERAGE OF INFANTS



Note:

Years 1977-78 to 1979-80 includes immunizations given to children up to 5 years of age

Years 1980-81 to 1984-85 includes immunizations given to children up to 2 years of age

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FIGURE 2: *IMMUNIZATION COVERAGE OF PREGNANT WOMEN*
INDIA, 1978 - 87

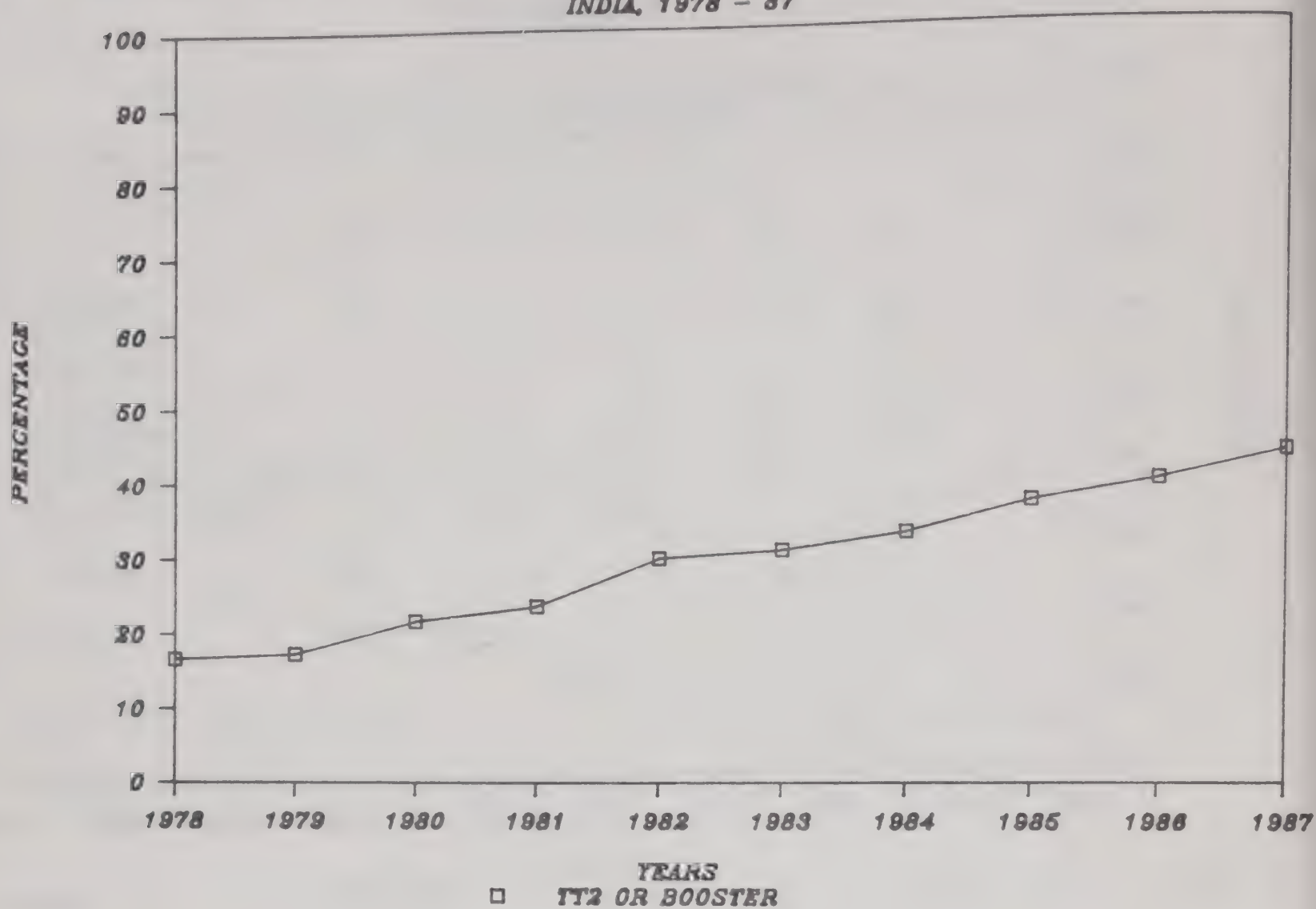


FIGURE 3: *INCIDENCE RATE OF DIPHTHERIA, INDIA*

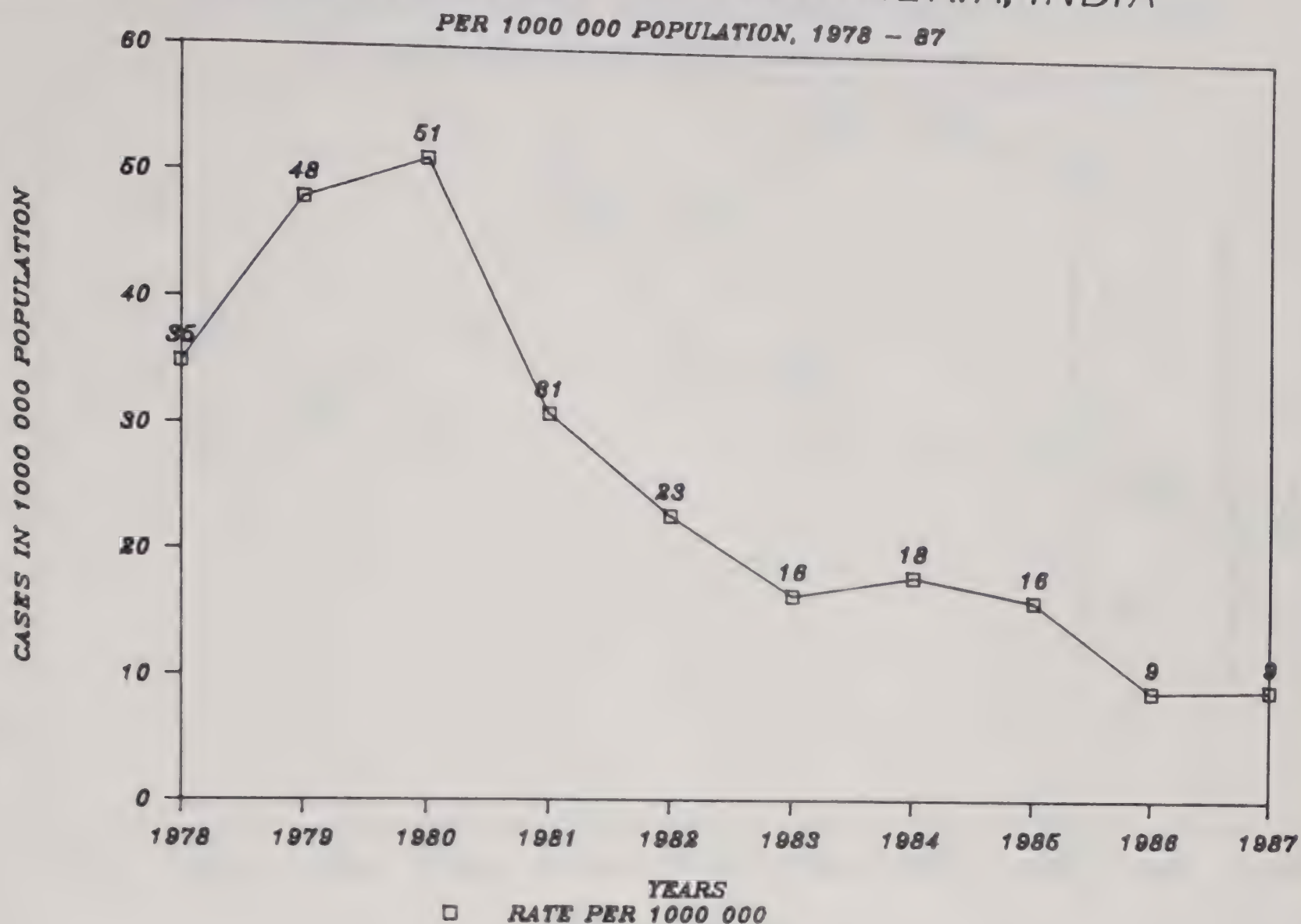


FIGURE 4: *INCIDENCE RATE OF MEASLES, INDIA*

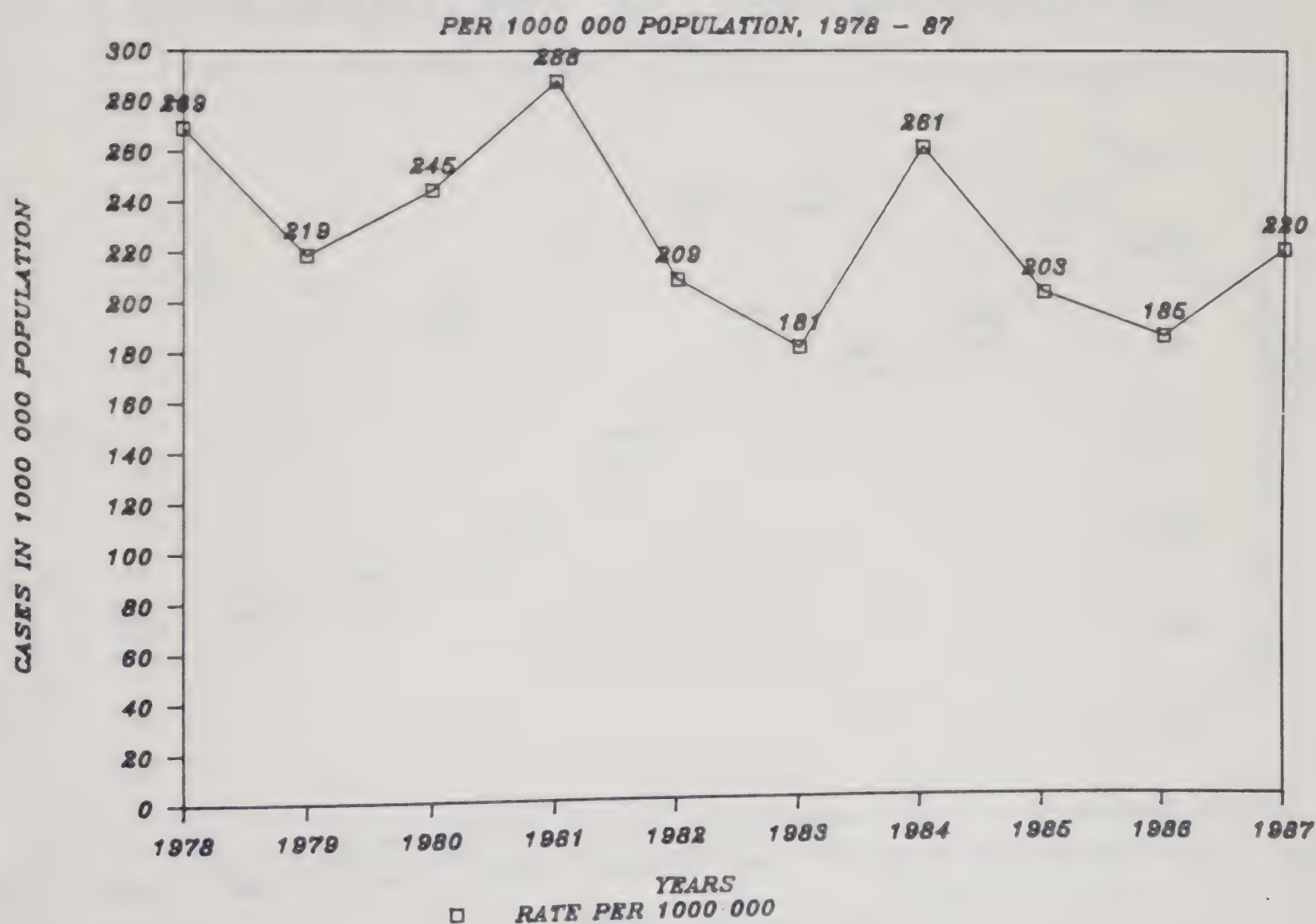


FIGURE 5:

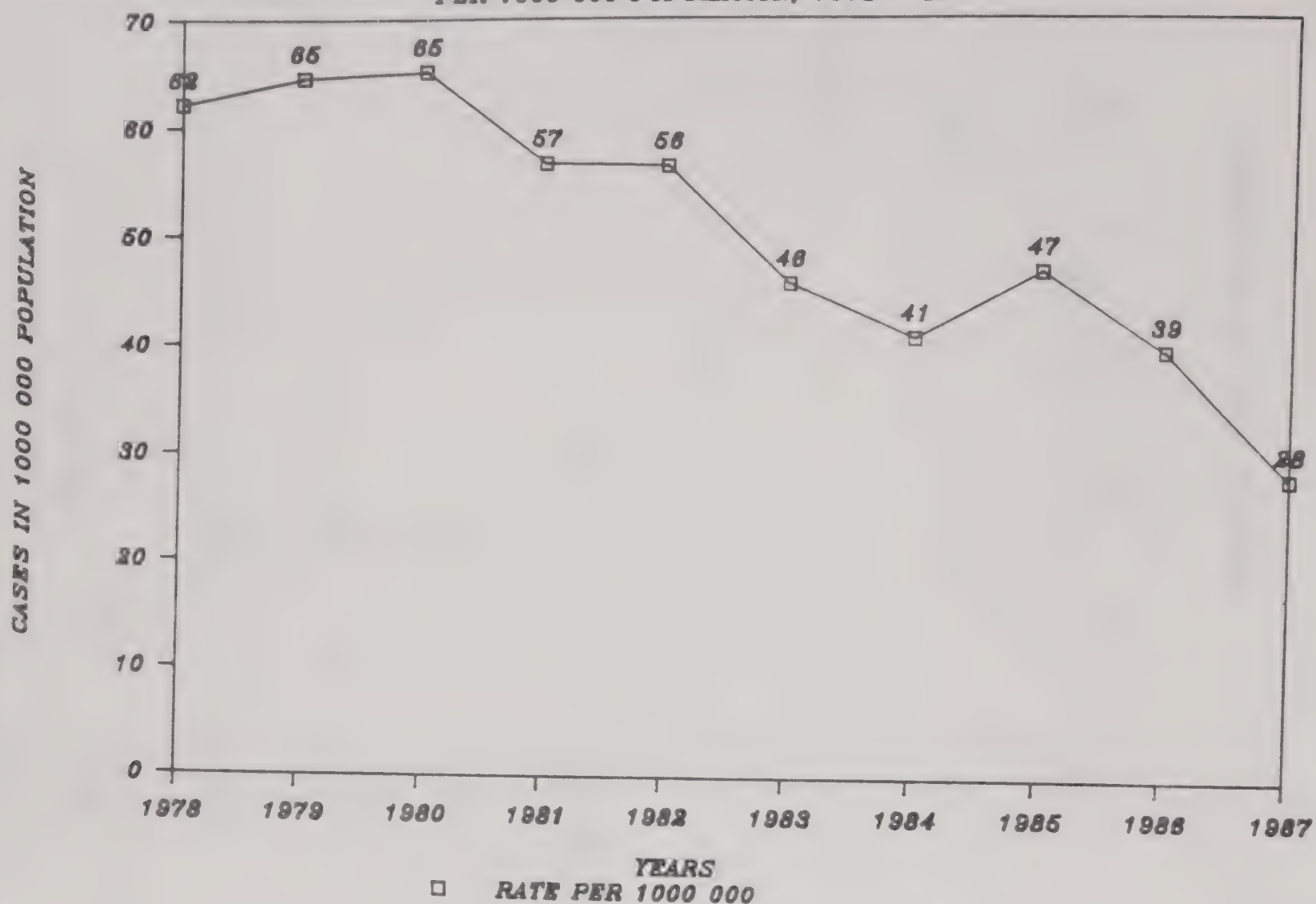
*INCIDENCE RATE OF TETANUS, INDIA**PER 1000 000 POPULATION, 1978 - 87*

FIGURE 6:

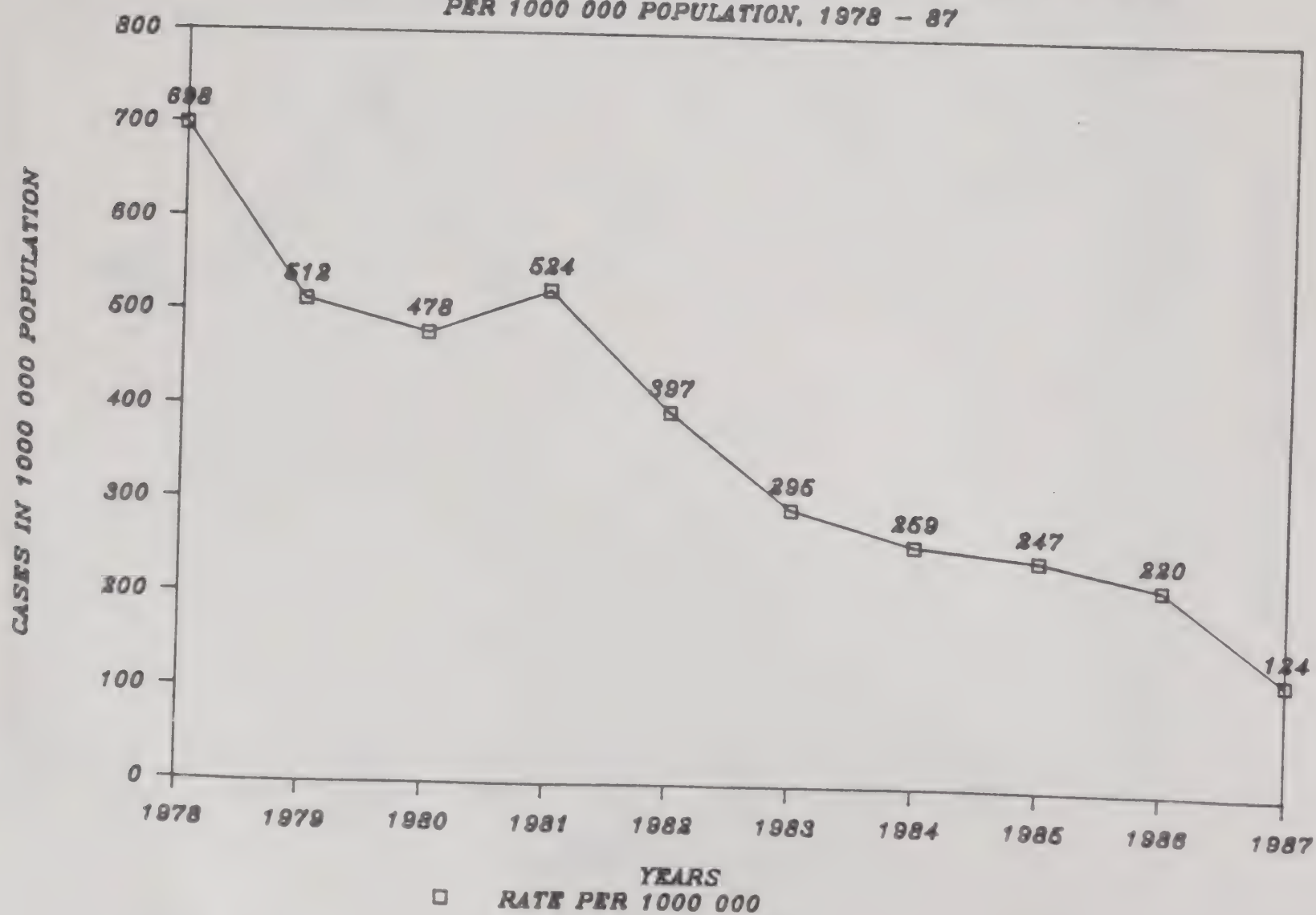
*INCIDENCE RATE OF PERTUSSIS, INDIA**PER 1000 000 POPULATION, 1978 - 87*

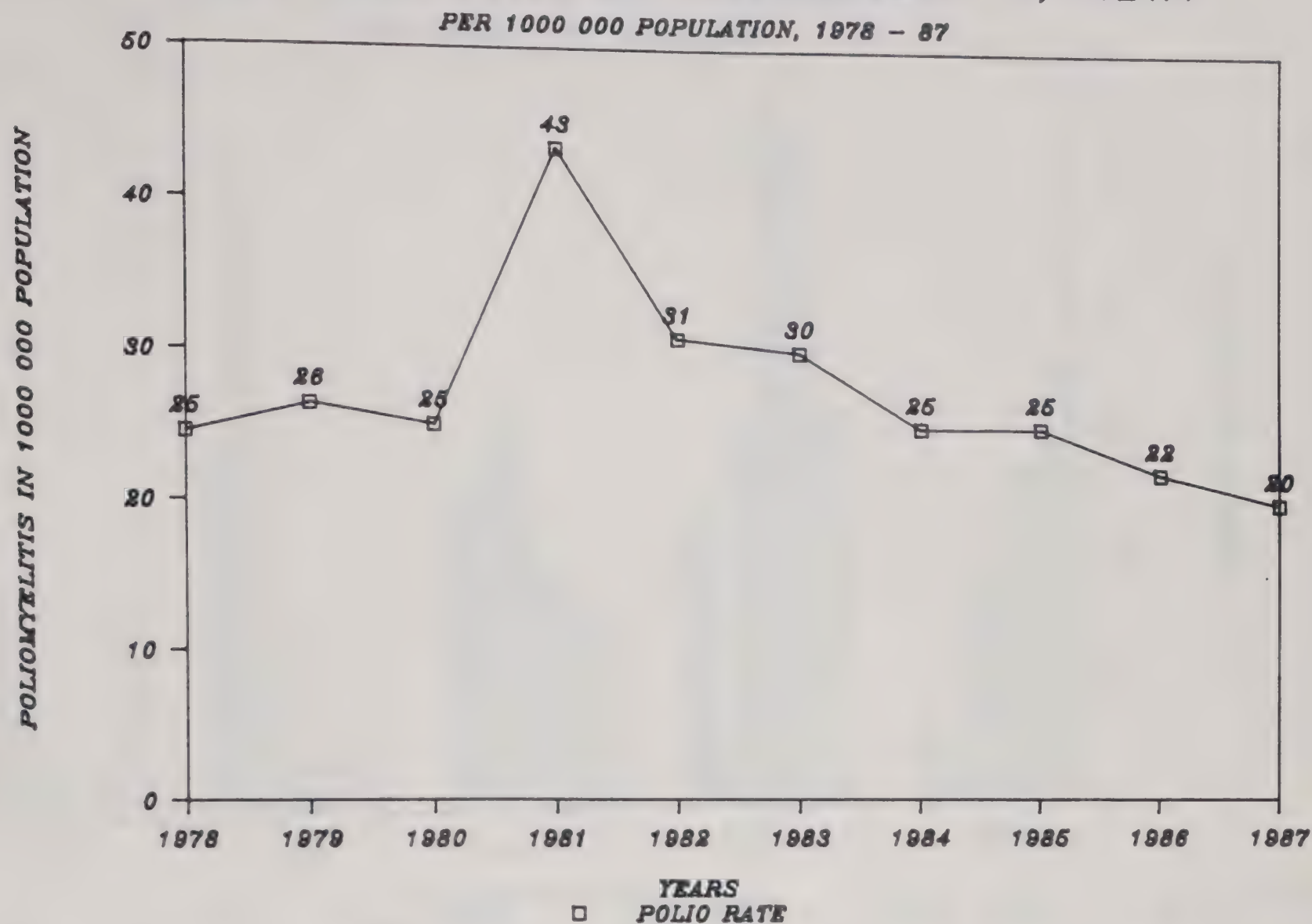
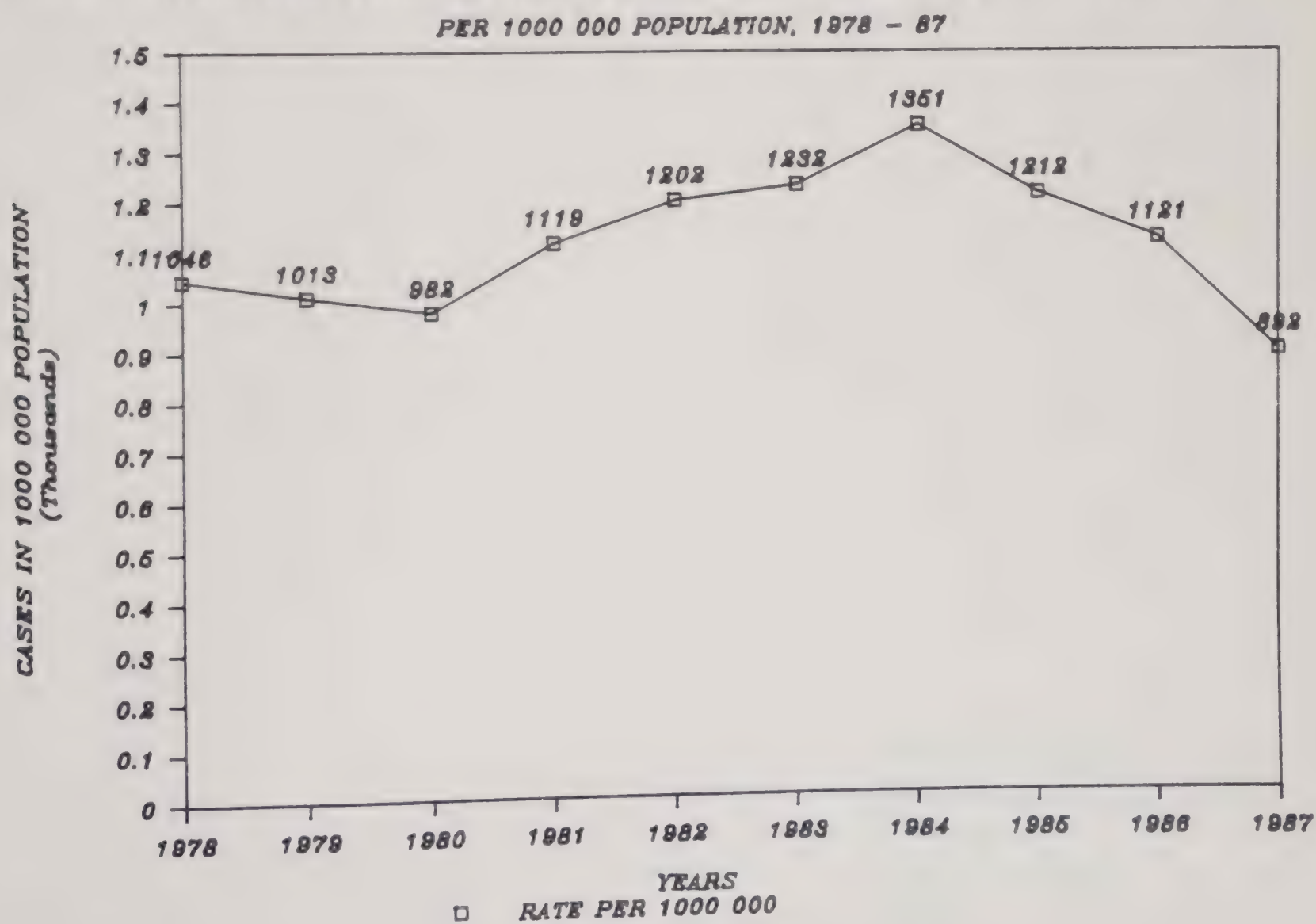
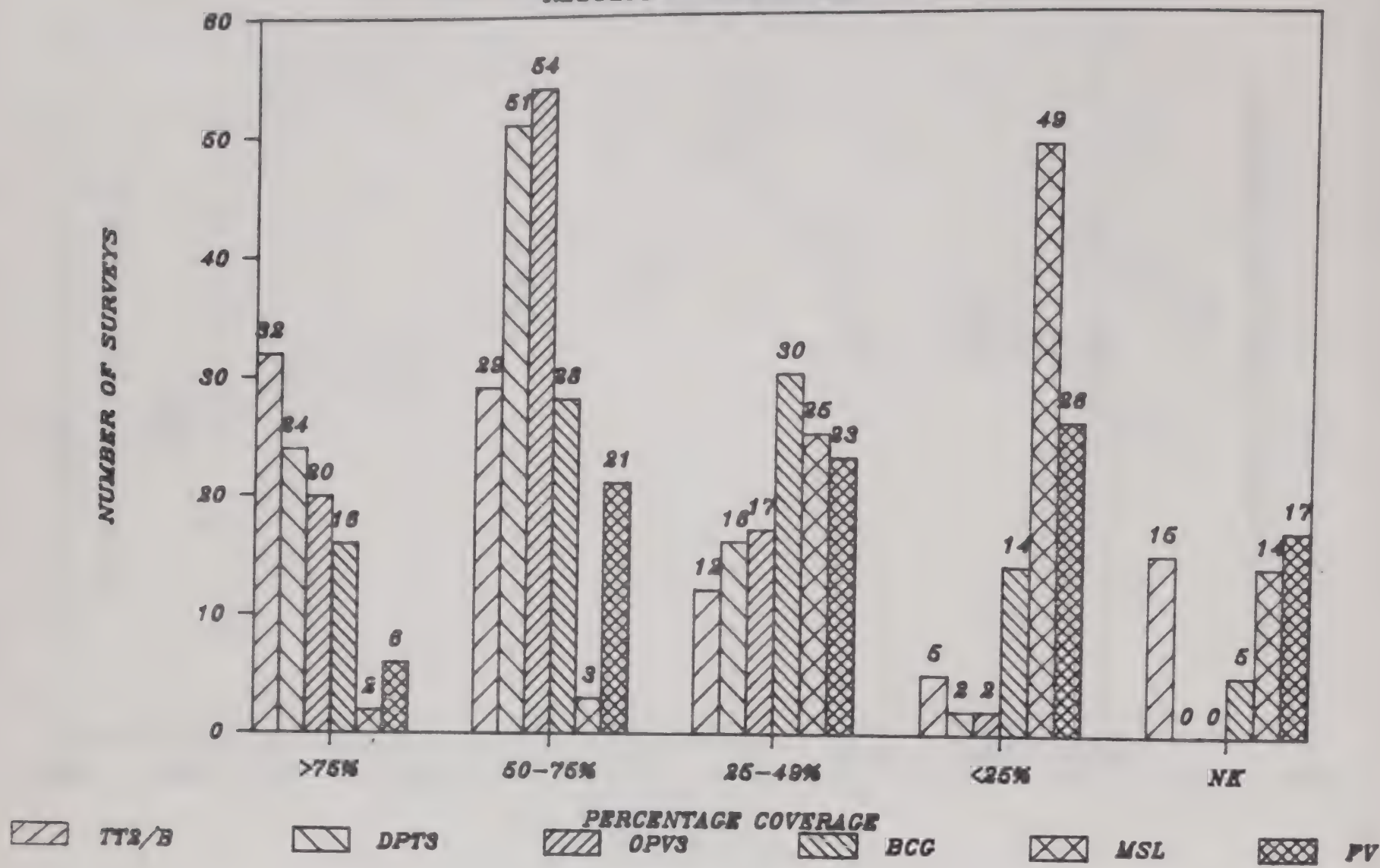
FIGURE 7: *INCIDENCE RATE OF POLIOMYELITIS, INDIA*FIGURE 8: *INCIDENCE RATE OF TUBERCULOSIS, INDIA*

FIGURE 9: *IMMUNIZATION COVERAGE, INDIA*
RESULTS OF 93 SURVEYS, 1987



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